Innovation in Sterile Processing: A Case Study for tray assembly at Hospital for Special Surgery

Goals:
1. Reduce the amount of trays which are missing instruments not noted on count sheets during assembly.
2. Improve quality of individual instrument inspection.
3. Maintain or improve productivity levels.
4. Reduce the amount of time required for new employees to be productive.

HSS trials AIM v.1.1
(Asisted Instrument Management)

• Machine Features
  • Machine uses visual recognition of instruments for count sheet verification.
  • Looping instruments are automatically assembled for stringing.
  • A concise list of missing instruments is presented to the technician at the end of the processing cycle.
  • AIM maintains an accurate log of instrument-by-instrument handling activities.
  • AIM informs the Technician about incorrect or missing instruments.

AIM Trials
• AIM’s performance is evaluated on the basis of experience with four high usage trays with large instrument counts.

<table>
<thead>
<tr>
<th>Instrument Type</th>
<th>No. of Unique Instruments</th>
<th>No. of Instruments</th>
<th>Largest Stringer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Basket</td>
<td>67</td>
<td>87</td>
<td>26</td>
</tr>
<tr>
<td>Hand Basket</td>
<td>12</td>
<td>34</td>
<td>48</td>
</tr>
<tr>
<td>Foot Basket</td>
<td>14</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>Spare Basket</td>
<td>14</td>
<td>47</td>
<td>33</td>
</tr>
<tr>
<td>Combined</td>
<td>16</td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

• Test trays consume an estimated 20% of assembly labor effort.
• Defects are monitored with current department KPI reporting system.
• Productivity is compared using data generated from AIM’s log and the existing instrument management system.

How AIM works
Instrument Tray Assembly
• Technician selects count sheet from menu on touch screen to initiate a new tray.
• Technician picks up an instrument at random from workstation, performs visual inspection, places on conveyor, and presses the “Process Button”.
• Instrument is indexed under camera and is visually recognized by AIM.
• AIM confirms that the instrument belongs in the tray.
• Looping instruments are sent to a collator where they are automatically accumulated in the correct order for stringing.
• All other instruments are returned to the technician who manually places them in the tray in the appropriate order.
• Technician is informed about instruments which do not belong in the tray or which exceed tray count.

A Case Study for tray assembly at Hospital for Special Surgery

10 Challenges for Improving the Tray Assembly Process

1. Excessive time spent sorting unorganized instruments sent to assembly stations.
2. Inconsistent methods for assembling trays from one employee to the next.
3. “Air counting” by technicians when verifying count sheets. Count sheet usually checked off from memory rather than at the time the instrument was inspected.
4. Technicians often inspect several instruments at a time.
5. Looping instruments are handled multiple times in the process of assembling a stringer.

AIM provides a mechanism for tracking time spent for individual instrument handling.

10 Challenges for Improving the Tray Assembly Process

6. Time wasted and concentration lost searching for missing instruments.
7. New employees challenged when learning more complex trays – creates bottlenecks in assembly.
8. Later shifts get more tray volume, and are more vulnerable to fatigue related quality issues.
9. Technician focus on verifying instrument quantity versus testing and quality inspection.
10. Existing tray tracking systems are ineffective on tracking production details.

Existing methods are too technician dependent for accurate data tracking.

How AIM Addresses the 10 Challenges

1. Presorting is no longer required with AIM so time is reallocated from sorting to inspection.
2. AIM ensures a consistent tray assembly process.
3. AIM provides a process that eliminates the possibility for “air counting”.
4. AIM assembly process is conducive to individual instrument inspection.
5. AIM eliminates multiple handling of looped instruments by automated stringer assembly.

AIM informs the Technician about instruments which do not belong in a tray.

How AIM works

How AIM addresses the 10 Challenges

6. AIM facilitates a more efficient process for the batching and gathering of missing instruments.
7. AIM is a resource for “precepting” so staff unfamiliar with instruments can be productive while learning.
8. CSP Technicians experience a fatigue factor especially on later shifts. AIM assists staff in maintaining focus on quality.
9. AIM handles actual counting and instrument identification allowing technicians to focus on testing and quality inspection.
10. AIM provides a mechanism for tracking time spent for individual instrument handling.